Formaldehyde Dehydrogenase (FDH) Activity Assay Kit (Plant Samples)

Note: Take two or three different samples for prediction before test.

Operation Equipment: Ultraviolet spectrophotometer/Microplate reader

Catalog Number: NA0202

Size: 100T/96S

Components:

Reagent	Size	Storage
Extract solution	Solution 110 mL×1	4℃
Reagent I	Solution 15 mL×1	4℃
Reagent II	Powder×2	-20℃
Reagent III	Powder×2	4℃
Reagent IV	Solution 2 mL×1	4℃

Solution preparation:

1. Reagent II: Add 0.25 mL distilled water (100T/96S) before use. Unused regents should be store at -20℃ for two weeks. (One bottle of powder can be made 100T after dissolving. In order to prolong the use time, one more bottle of powder for this product)
2. Working solution of Reagent II: According to the amount required for the test, prepare the Working solution according to the ratio of Reagent II (μL): Distilled water (μL) =1:29, and prepare the reagents when it will be used. The Working solution of Reagent II should be used up on the same day if it is prepared on the same day.
3. Reagent III: Add 0.6 mL distilled water before use. Mix thoroughly. Unused reagents should be store at -20℃ for two weeks.

Product Description：

Formaldehyde dehydrogenase exists in most prokaryotes and all eukaryotes. It is an oxidoreductase that converts formaldehyde. Formaldehyde dehydrogenase can catalyze formaldehyde and NAD^+ to produce NADH. The absorbance at 340 nm will increase. By measuring the change at 340nm, the activity of formaldehyde dehydrogenase can be calculated.

Reagents and Equipment Required but Not Provided：

Ultraviolet spectrophotometer/microplate reader, desk centrifuge, pipette, micro quartz cuvette/96 well UV flat -bottom plate, mortar/homogenizer, ice and distilled water.

Procedure

I. Sample preparation:

Tissue: According to the ratio of tissue weight (g): Extract solution (mL) =1:5~10. It is suggested to weigh about 0.1 g of tissue and add 1 mL of Extract solution. Homogenize on ice. Centrifuge at 8 000 g, 4℃ for 10 min. Take the supernatant for test.

II. Determination procedure：

1. Preheat ultraviolet spectrophotometer/microplate reader for 30 minutes, adjust wavelength to 340 nm, set zero with distilled water.
2. Preheat the Reagent I and Reagent IV at 25℃ for 10 min.
3. Add 20 μL sample, 110 μL Reagent I, 50 μL Working solution of Reagent II, 10 μL Reagent III and 10 μL Reagent IV in the micro quartz cuvette or 96 well UV flat-bottom plate. Mix them immediately and time them. Record the absorbance value at 20s A1 and 5 min 20s A2 at 340 nm. Calculation ΔA= A2-A1.

III. Calculations：

1. Calculate by sample protein concentration

Unit definition: One unit of enzyme activity is defined as the amount of enzyme catalyzes production of 1 nmol of NADH in the reaction system per minute every milligram protein.

FDH (nmol/min/mg prot) =ΔA÷ (ε×d) ×V_R×10^9÷ (V_S×Cpr) ÷T×F=322×ΔA÷Cpr×F

2. Calculate by sample weight

Unit definition: One unit of enzyme activity is defined as the amount of enzyme catalyzes production of 1 nmol of NADH in the reaction system per minute every gram tissue.

FDH (nmol/min/g weight) =ΔA÷ (ε×d) ×V_R×10^9÷ (V_S×W÷V_E) ÷T×F=322×ΔA÷W×F

V_S：Add sample volume, 2×10^{-4}L；

V_R: Total reaction volume, 0.2 mL;

V_E: Extract solution volume, 1 mL;

ε：Extinction coefficient of NADH, 6220 L/mol/cm；

d：Optical path of cuvette, 1 cm；

T: Reaction time, 5 min;

Cpr: Protein concentration of sample, mg/mL;

W: Sample weight, g;

F: Dilution ratio.

Note:

1. If the measured absorbance value A>1.5 or ΔA>0.5, it is recommended to dilute the sample before measuring, and multiply the dilution factor in the calculation formula; if the measured absorbance value is low, it is recommended to increase the sample volume before performing the measurement.

Experimental example

1. Take 0.1 g of Epipremnum aureum. Add 1 mL of Extract sulution. Homogenize on ice. Centrifuge at 8 000 g, 4℃ for 10 min. Take the supernatant for test. Following the measurement procedure. Calculate ΔA=A2-A1=0.5795-0.4723=0.1072. Calculate the activity of formaldehyde dehydrogenase (FDH) in Epipremnum aureum according to the formula:

FDH activity（nmol/min/g weight）=322×ΔA÷W×F=345.184 nmol/min/g weight.

Related products

NA0201/NA0200 Formaldehyde Dehydrogenase (FDH) Activity Assay Kit (Animal Samples)

NA0199/NA0198 Formaldehyde Dehydrogenase (FDH) in Cells, Bacteria and other Liquid Samples

Activity Assay Kit (Micromethod and liquid samples)